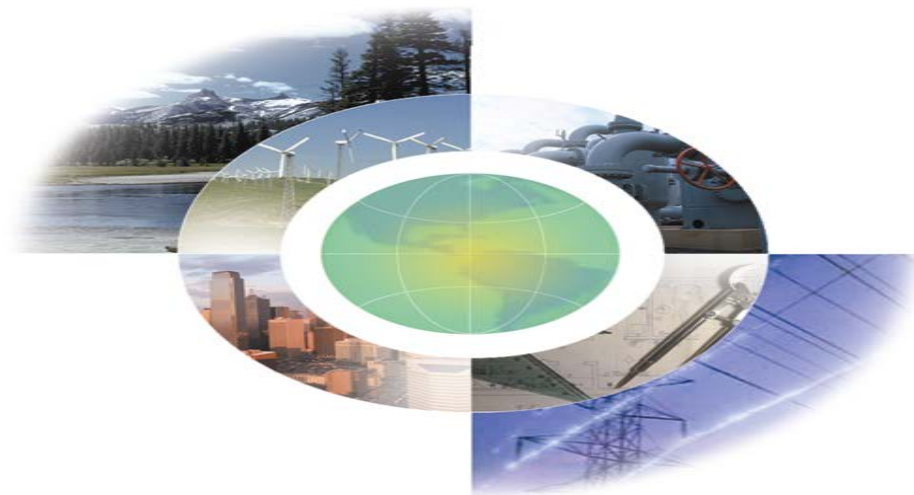




Advanced Metering – Using Advanced Metering to Improve Building Performance



FUPWG Presentation
Energy Division, FMSP
May 7, 2014



Training Approach

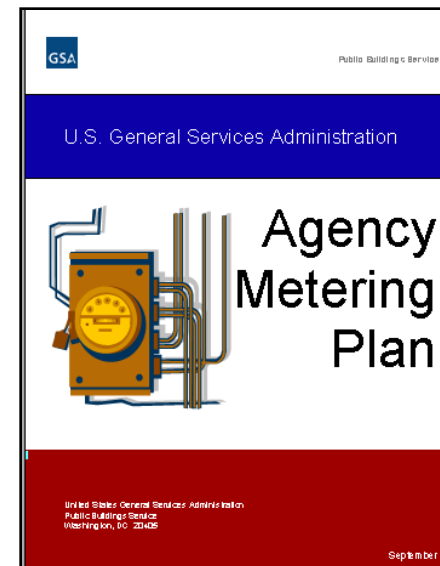
Think About – Ask yourself...

- What data/info do I want to see?
- What else would be helpful to know?
- Knowing How/When we use energy/water – What can I do?
- Hours of Operation/ Core Bldg Hours
- Tenant Perspective– Impact their needs have on Energy Bottomline – ie Computer Rooms/Data Centers/ OT Utility Requests



GSA Advanced Metering Plan

- **Development of Agency Plan**
 - What are the objectives?
 - Meet mandates
 - How are we going to use Metered Data?
 - Current and Future Metering Needs
- **Agency original plan submitted to DOE in 2006 (Updated every 2 yrs)**
 - Prioritized based on total electricity usage & cost (typically site with most DR opportunities)
- **Current Priorities (Still meet Practibility test)**
 - Covered Facilities (EISA07) – Top Energy Users (196 facil)
 - Sites receiving ARRA Funding
 - Bldgs where Financing Energy Project
 - Bldgs with onsite generation (PV, Cogen, Wind turbines)
 - New Construction





Use of Metering Data(Bldg Perspective)

Energy billing & procurement

- Verifying utility bills
- Tenant energy use (sub metering)
- Identifying best rates
- Participating in demand response programs

Optimize/Review performance

- Diagnose equipment & systems operations
- RETUNING
- Benchmark utility use
- ID potential projects
- ID power quality problems
- Modelling (more adv users)
- On-Site Generation monitoring

Verify project performance

Promote energy awareness

Demand Response Programs

- Monitor actions when response needed
- Measure results
- ID potential savings from DR

Use of Metering Data

(Agency – Enterprise View)

Energy Procurement

- Load Aggregation
- Load Factor
- Participating in demand response programs

Benchmarking

- Baseline comparisons
- Start-Up Comparisons
- Energy/Water intensity
- Trends across similar bldg types

Verification for
Reporting
Mandates

Promote energy
awareness
& Sharing Lessons
Learned

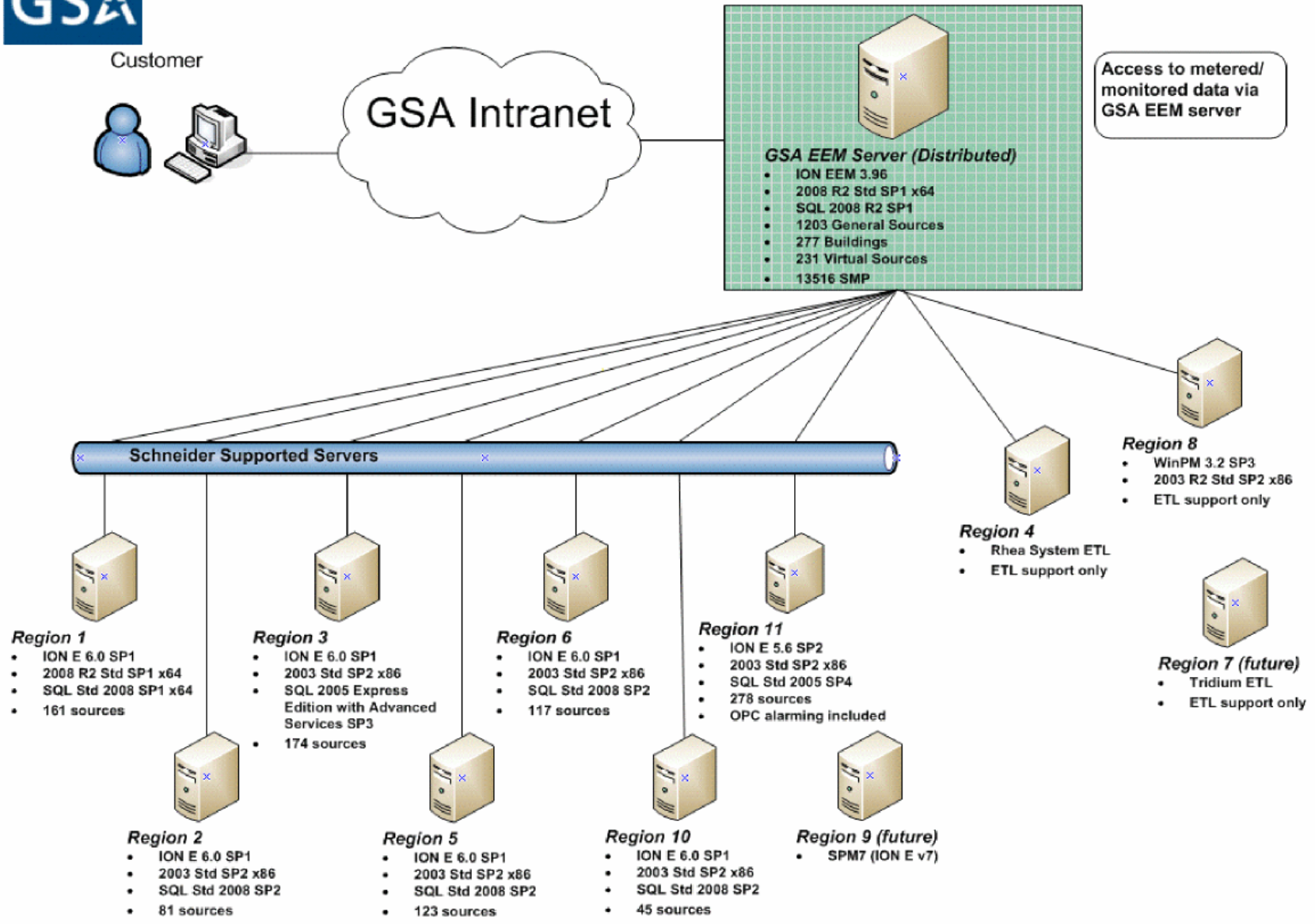


CRITICAL POINT--Take Away!!

- Advanced Meters alone DO NOT SAVE ENERGY/ WATER!!
- Must Have engagement and TIME to review data and ACT!
- We need to make it Priority – Demonstrating possibilities... and Cost Savings associated with those will get them engaged!!

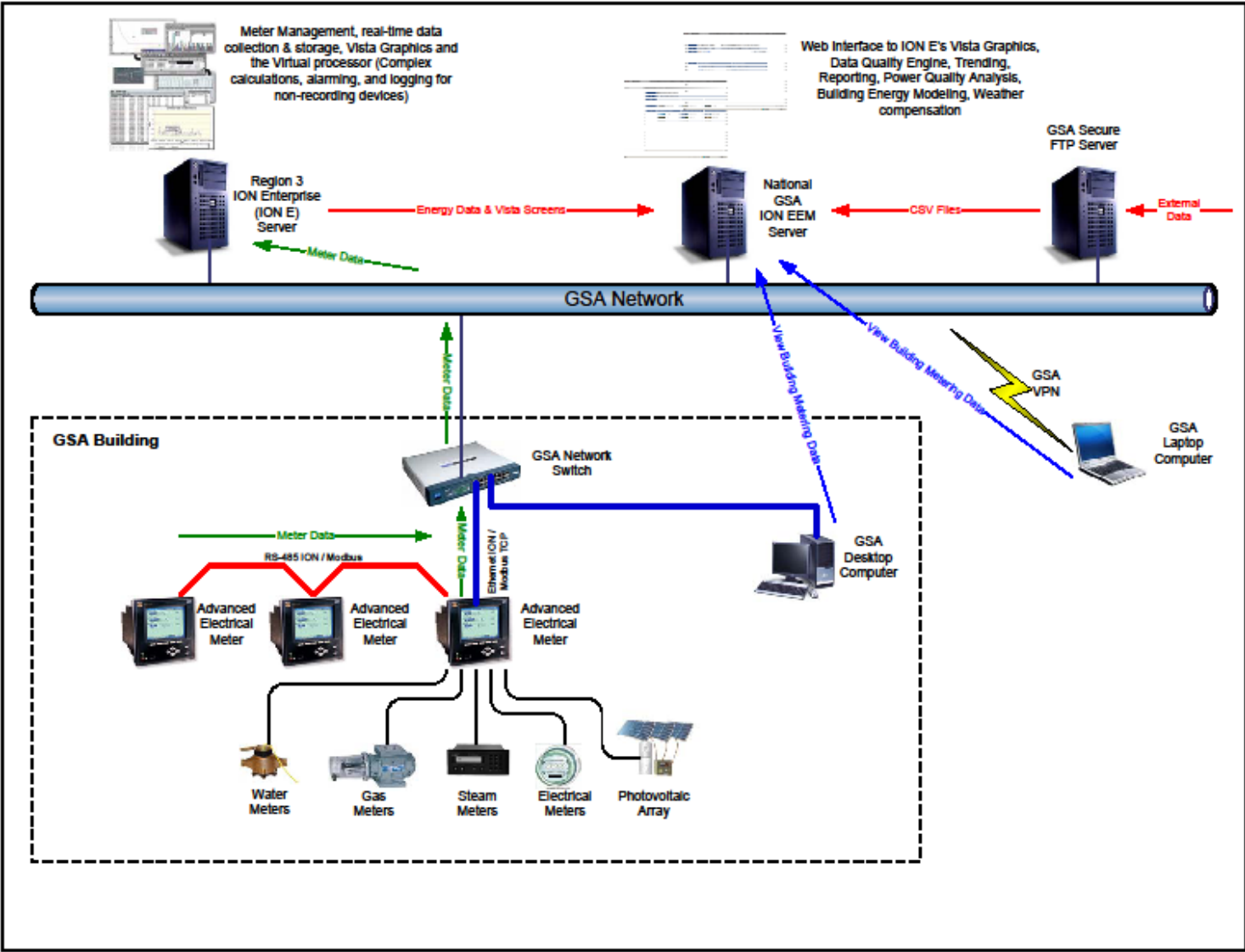


GSA Server Architecture





Adv Metering Data Flow Diagram





How can Metering Improve my Bldg's Operation and Efficiency

- Identifying anomalies in usage patterns
- Start up and shut down schedules not matching what should be
- Overtime Utility usage
- Baseloading info – comparison to similar sites
- Observing during Load curtailment events
- Watch impact on consumption by adjusting schedules
- Leak detection
- ADVANCED: Modelling/ Power Quality Analysis

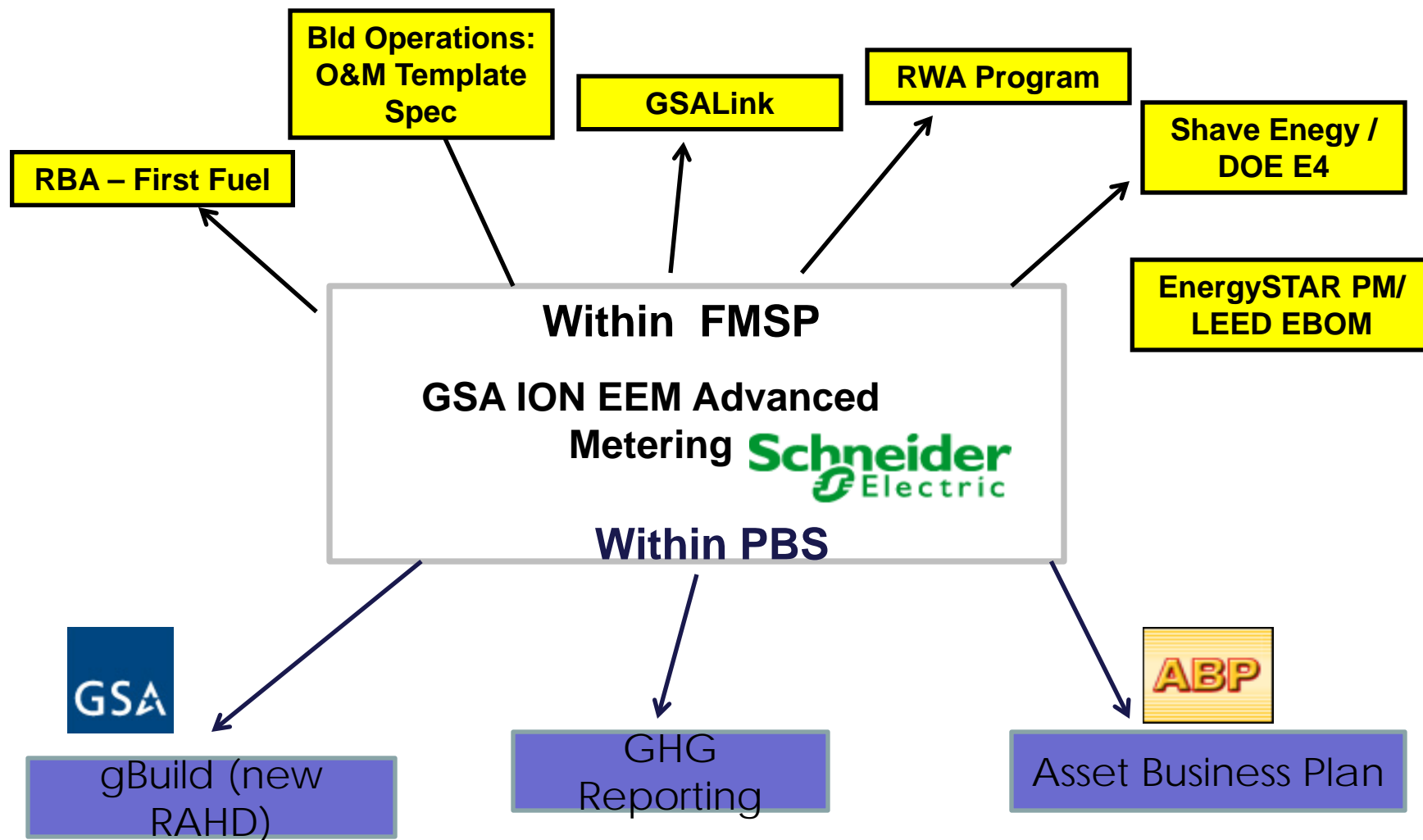


How we are ACTUALLY using the Data

- Engaging (Partnering) O&M Staff/ Energy Teams
 - Reviewing trends daily / periodically – asking questions, Why ? Should this be occurring?
 - Finding Leaks (Water)
 - Modifying our O&M Specs to require review of data
 - Provides oversight to our O&M, not possible before, especially in remote sites
- Using Report Subscription Capability
 - O&M Staff/ Senior Mgmt
- Making Models to validate suspicions
- Re-Tuning
 - Proper analysis of utility and interval meter data can result in the identification of significant energy savings opportunities and possibly improve overall building operations.
 - Using it with First Fuel Software (Rapid Bldg Assessment)



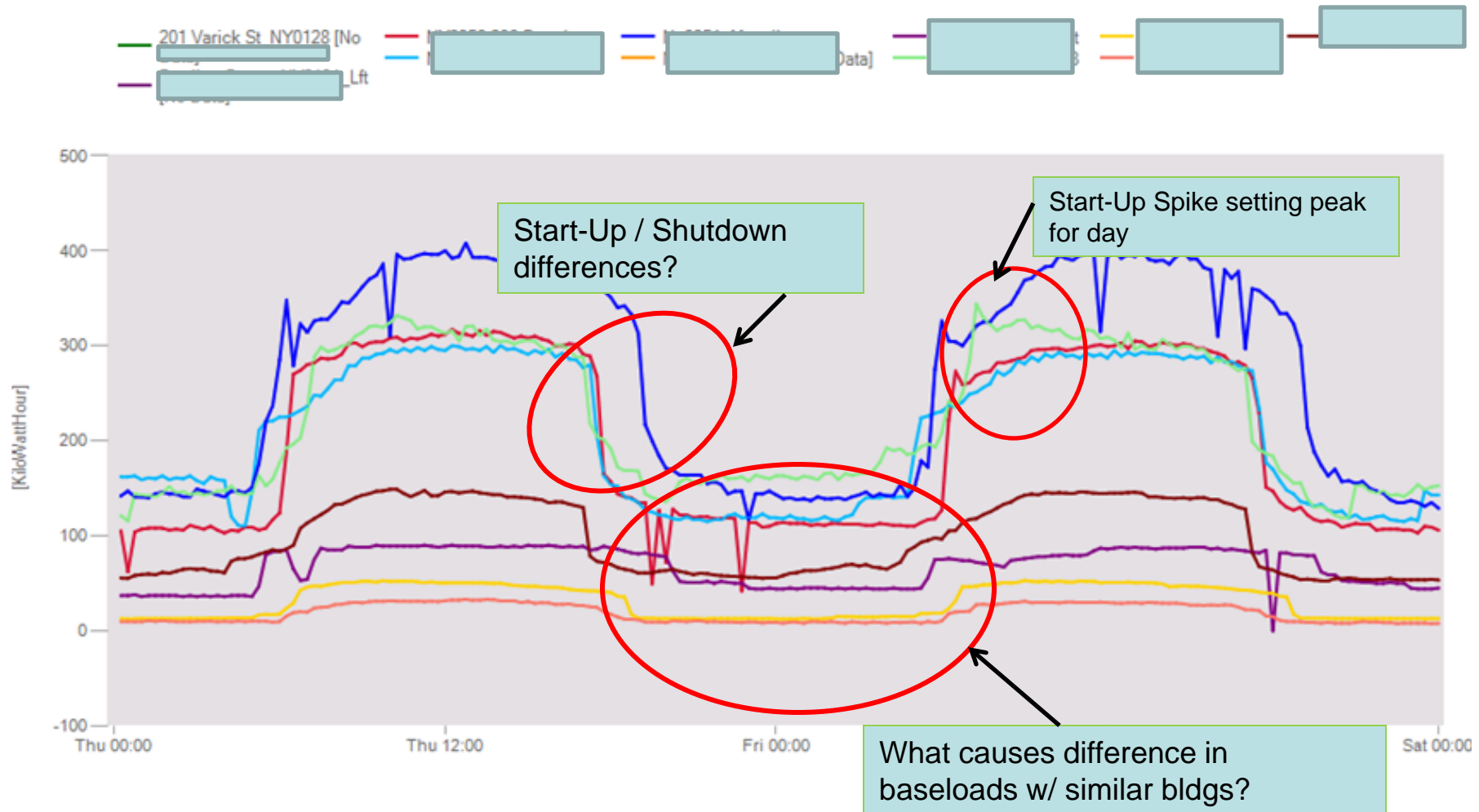
Advanced Metering- Interaction with PBS Programs

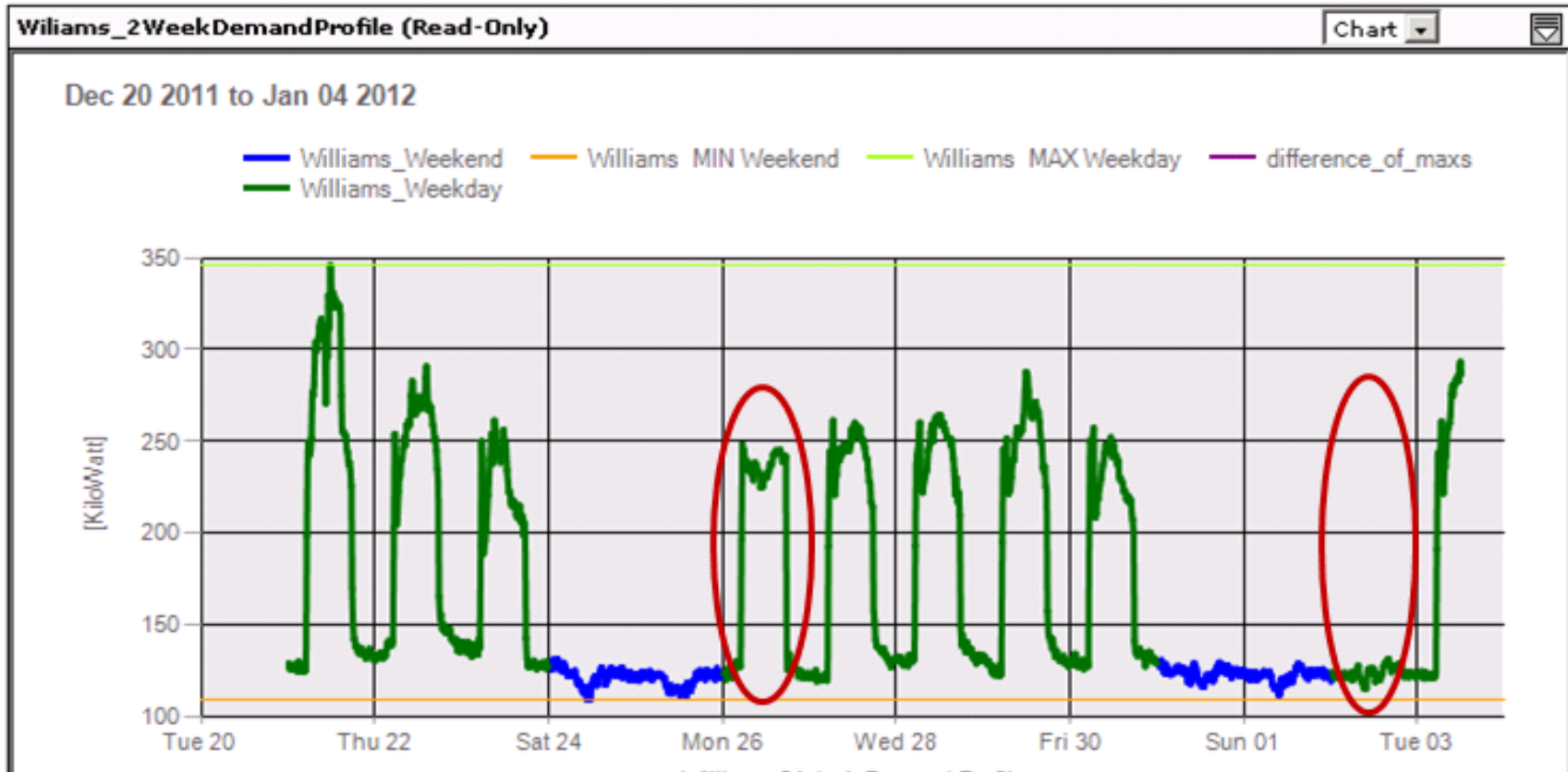


Reg 2 – Since Yesterday

Reg2_SinceYester_Elec

Feb 02 2012 to Feb 04 2012





- Noticed did not observe a holiday setback for 12/26/2011. Notified Mechanical Contractor (sent copy of trend)
- Holidays were not programmed into the BAS.
- Another Bldg – same thing found in Lighting DDC Controls – by observing trends
- Added a PM into CMMS -- holiday schedule is reviewed yearly against the published federal holiday schedule.



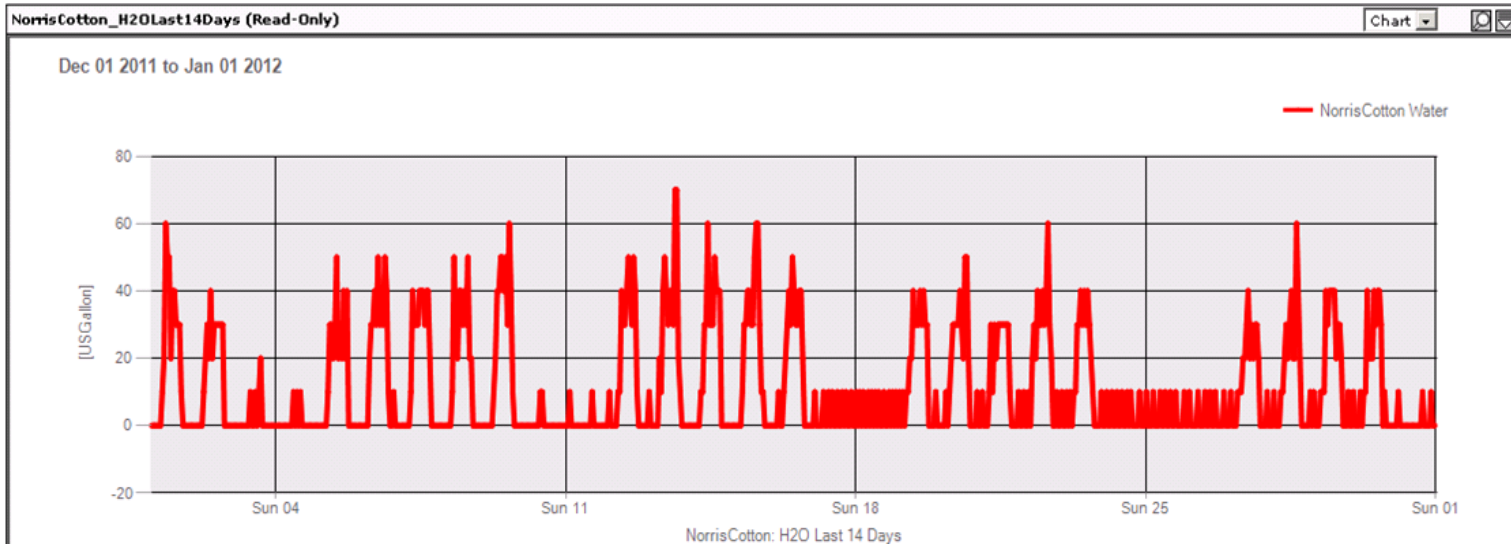
Results:

Savings will coming from **Optimizing** and **Improving** Day to Day Operations

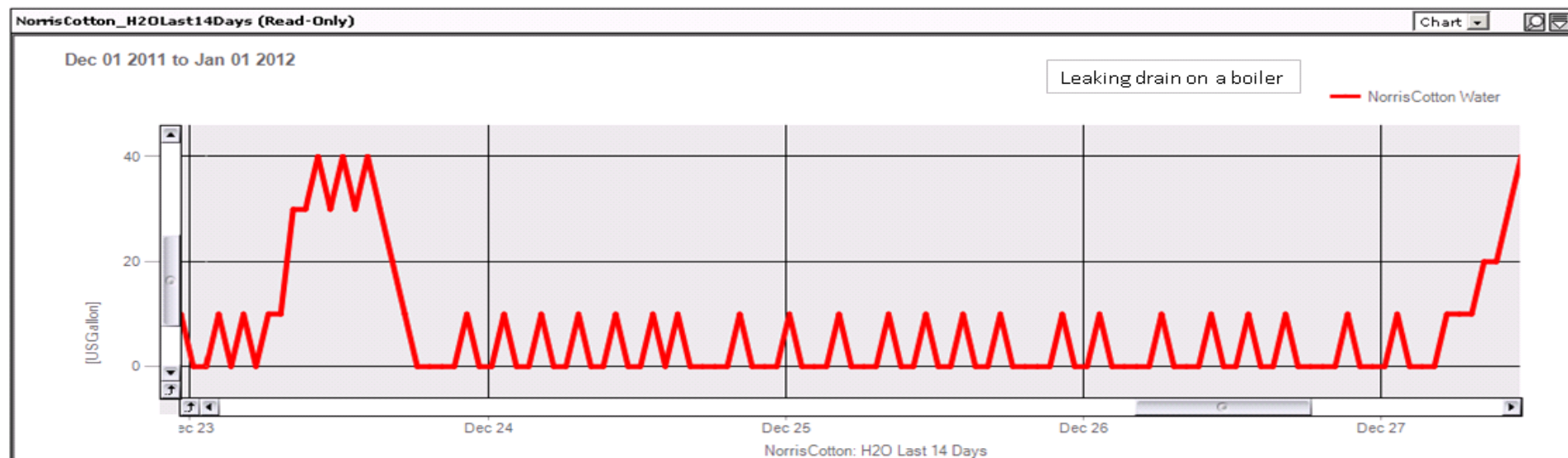
Being used already to
“Shave” Energy – NCR
Night audits

Jul 11 2011 to Jul 14 2011



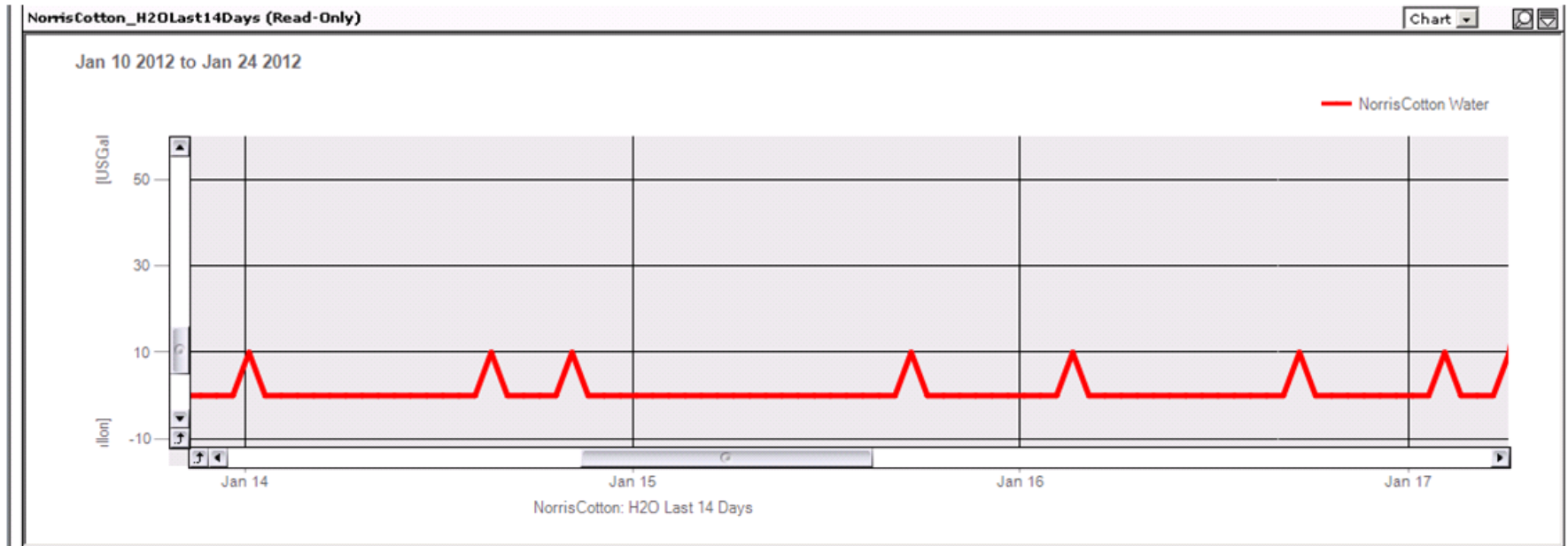


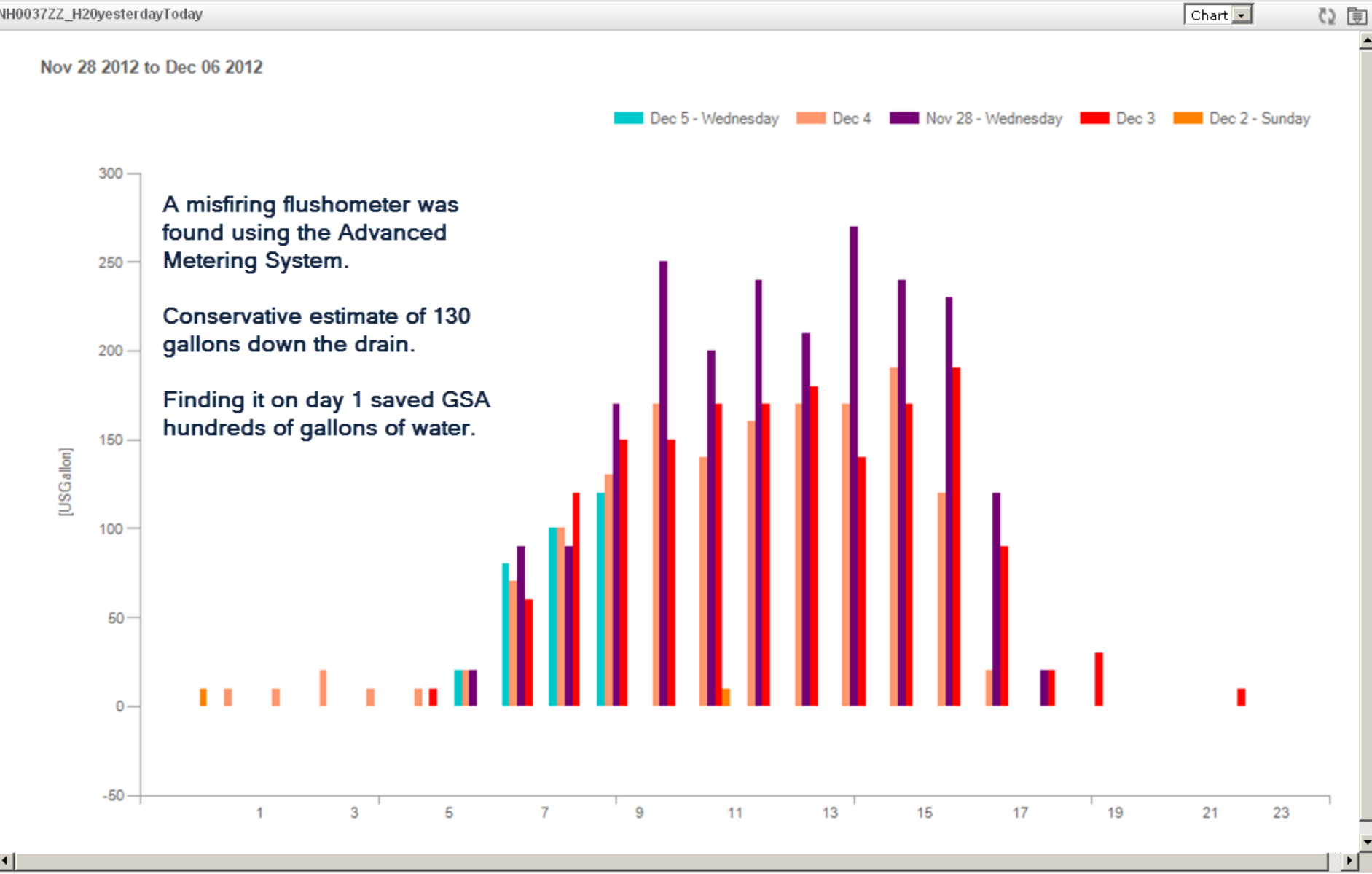
Property mgr at Cotton FB (NH) suspected water leak when he saw these 10 gallon spikes. He showed metering graphs to Mechanical contractor & they began to track it down. Leak was found to be a leaking drain on boiler.



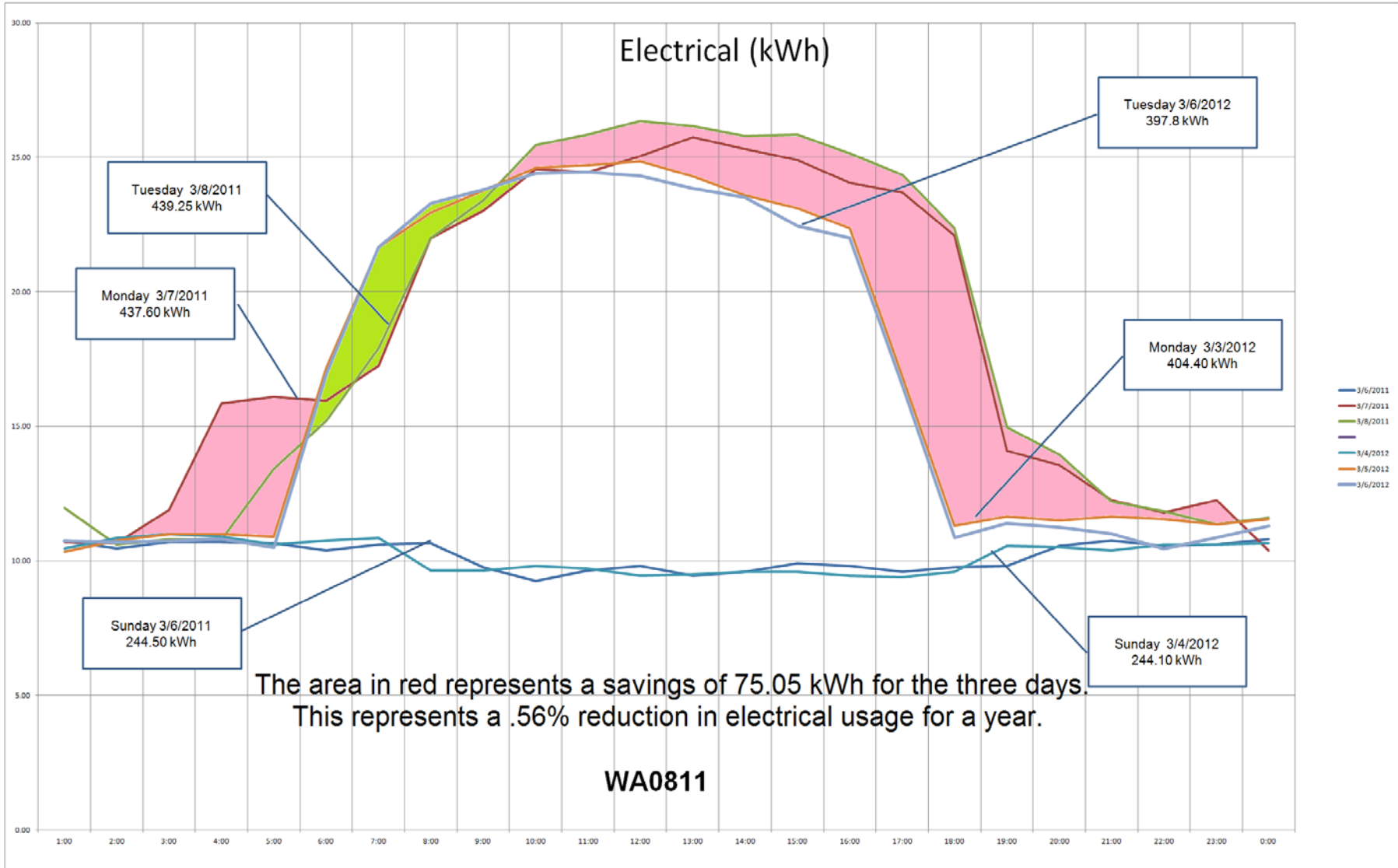


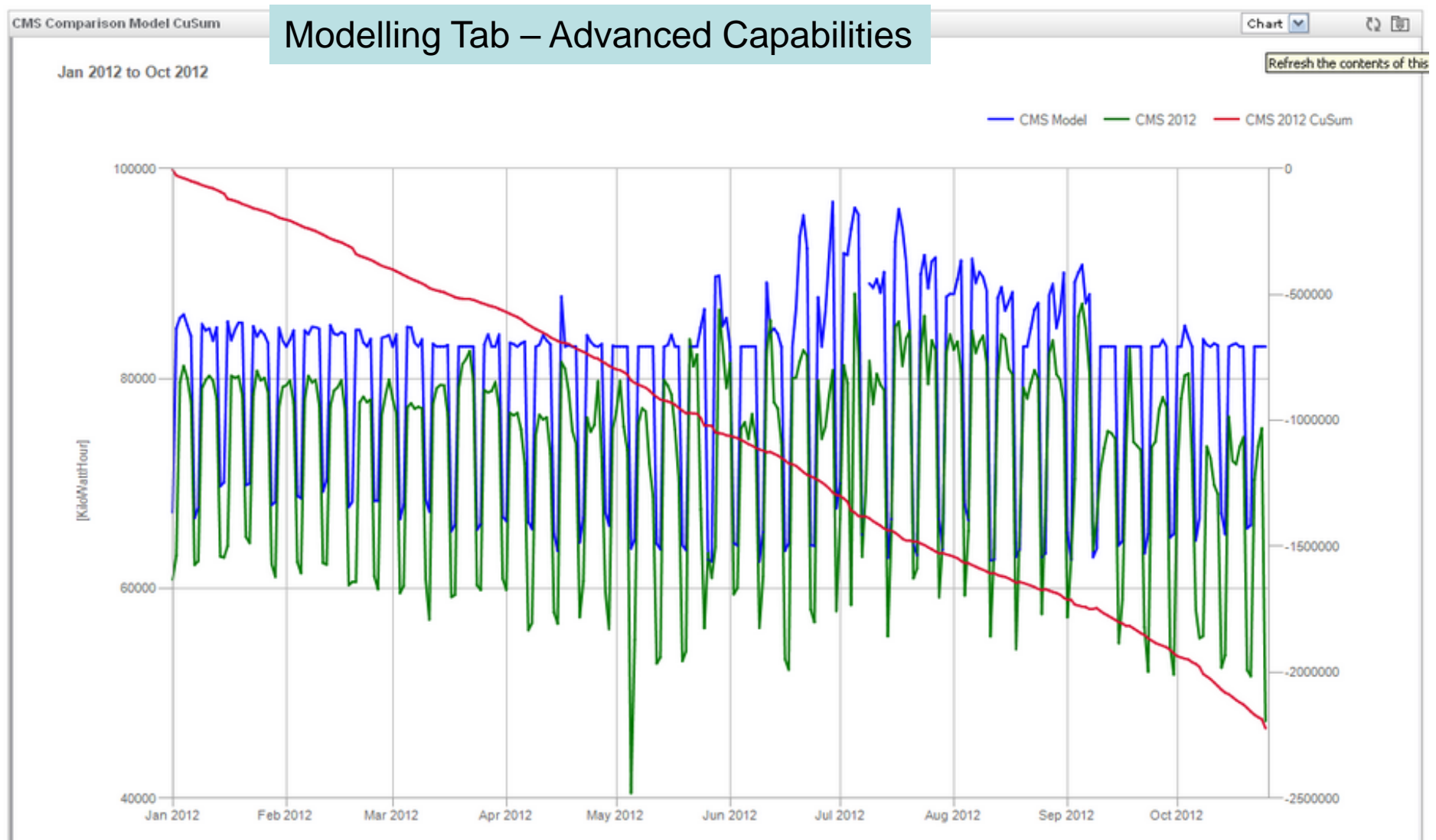
After leak was fixed

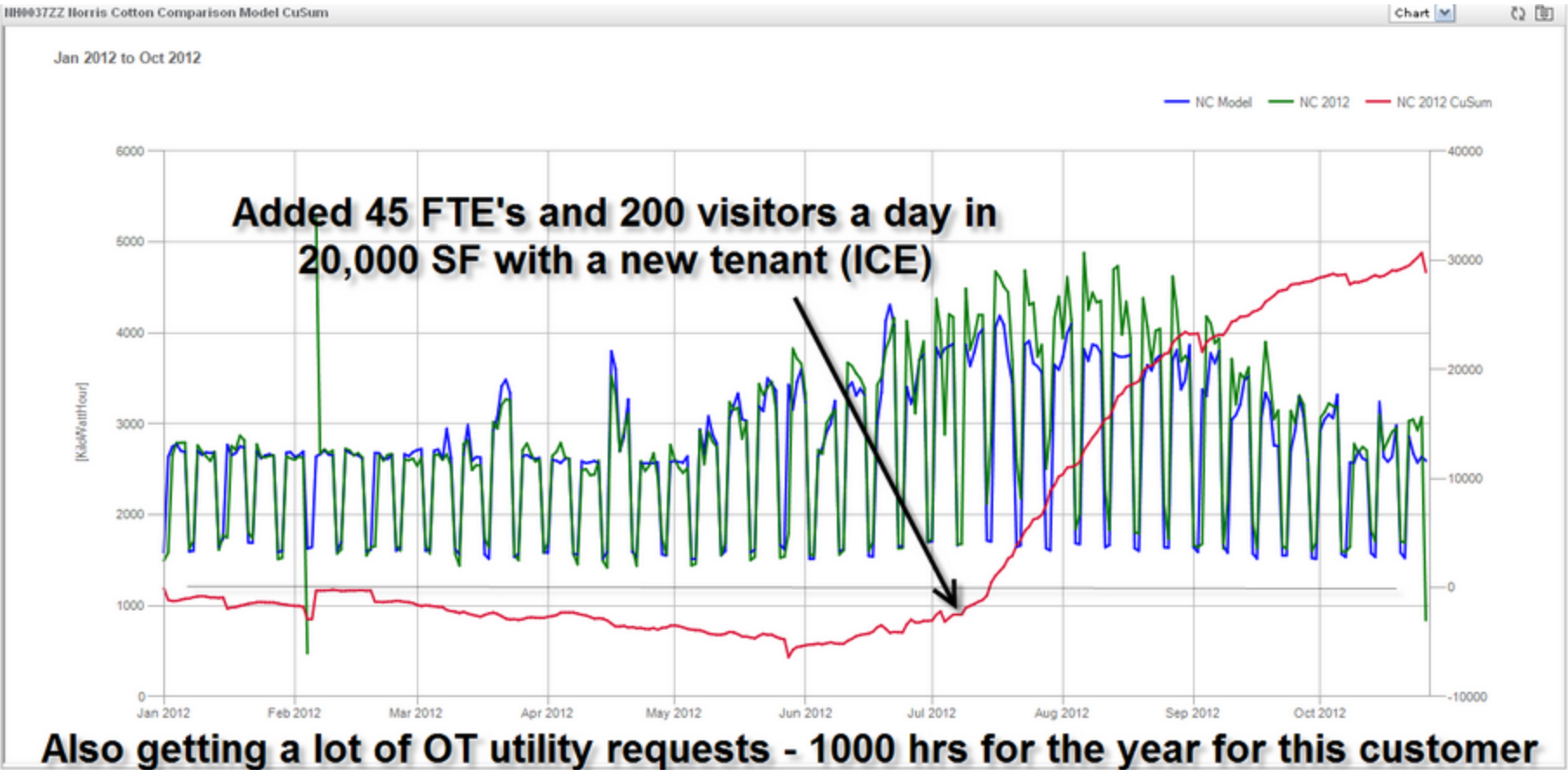




Example of Savings Potential

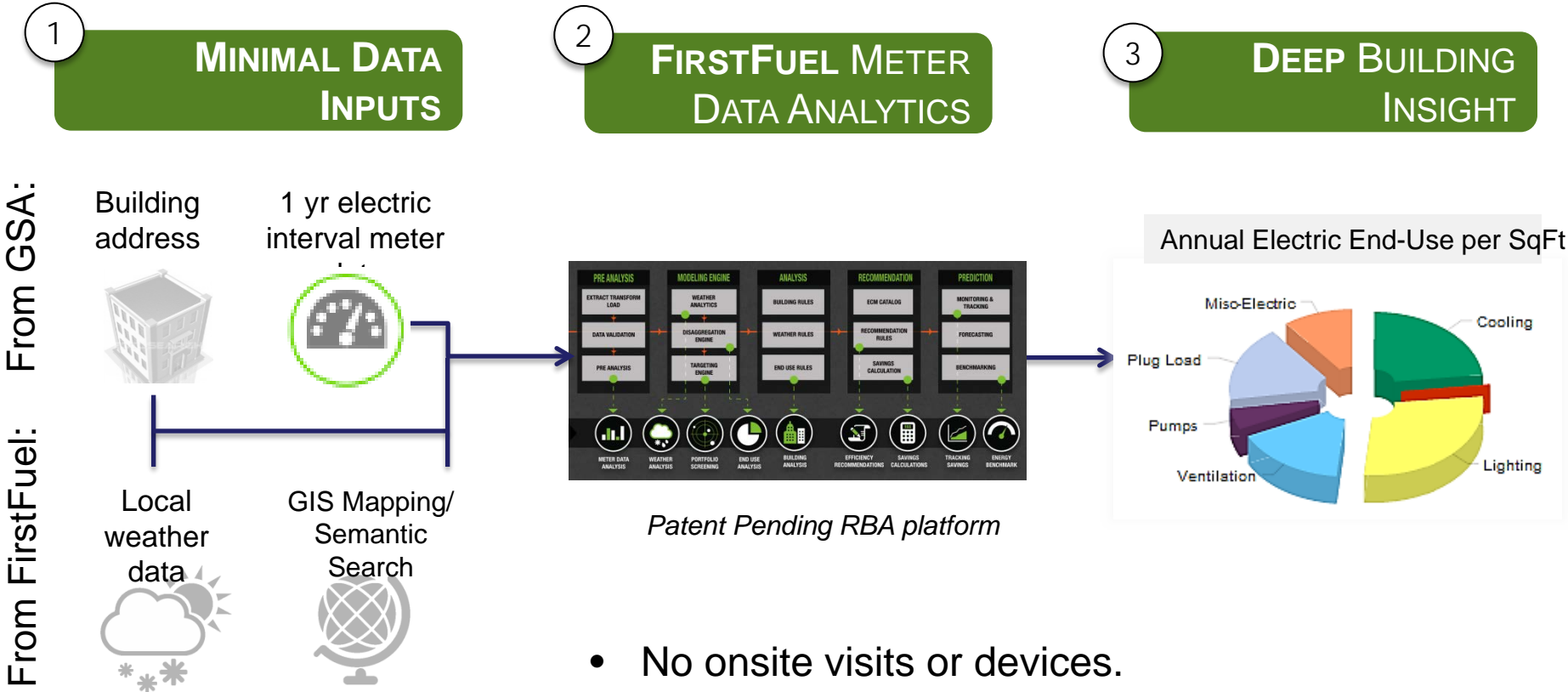








Breakthrough Innovation in Remote Meter Data Analytics



- No onsite visits or devices.
- No building simulations or buildings “like” this one
- Unique, accurate analysis on every building.



Follow Up Questions

Questions on this presentation:

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